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New Utility Patent Application Transmittal (to be used for new applications only)		
	Attorney Docket Number	247P1US
	First Named Inventor	Meho Karalic
	Total Pages in this Submission	17

jc534 U.S. PTO 09/414483 10/08/99

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APPLICATION ELEMENTS

Notice: Checklist items mentioned under Application Elements section construct a new utility patent application. Please refer to MPEP Sections 506, 601 (37 CFR 1.77, 1.53, 35 USC 111, 112, 113) or detailed explanation regarding completeness of an original patent application.

1. ☒ Fee Transmittal Form (prescribed filing fee(s).
2. Specification
   - ☒ Title of the Invention
   - ☐ Cross References to Related Applications *(if applicable)*
   - ☐ Statement Regarding Federally-sponsored Research/Development *(if applicable)*
   - ☐ Reference to Microfiche Appendix *(if applicable)*
   - ☒ Background of the Invention
   - ☒ Brief Summary of the Invention
   - ☒ Brief Description of the Drawings *(if drawings filed)*
   - ☒ Detailed Description
   - ☒ Claim or Claims
   - ☒ Abstract of the Disclosure
3. ☒ Drawing(s) *(when necessary as prescribed by 35 USC 113)*
4. ☒ Executed Declaration
5. Genetic Sequence Submission *(if applicable, all must be included)*
   - ☐ Paper Copy
   - ☐ Computer Readable Copy
   - ☐ Statement Verifying Identical Paper and Computer Readable Copy

ACCOMPANYING APPLICATION PARTS

6. ☐ Assignment Papers
   - ☐ Cover Sheet
7. ☐ Certified Copy of Priority Document(s) *(if foreign priority is claimed)*
8. ☐ Computer Program in Microfiche
9. ☐ English Translation Document *(if available)*
10. ☐ Information Disclosure Statement/PTO-1449
    - ☐ Copies of IDS Citations
11. ☐ Petition Checklist and Accompanying Petition
12. ☐ Preliminary Amendment
13. ☐ Proprietary Information
14. ☒ Return Receipt Postcard
15. ☒ Small entity statement
16. ☐ Additional Enclosures *(please identify below)*

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm or Individual Name: Brian M. Long

Signature: B. M. Long.

FOR OFFICIAL USE ONLY

Application Number			Class		Independent Claims	
Date of Receipt	Application Type		GAU		Total Claims	
	Filing Date		Foreign Filing License?		Drawing Sheets	
	Small Entity		Foreign Address?		Special Handling?	

Applicant or Patentee: **Meho Karalic**
Serial or Patent No.: **Not yet known**
Filed or Issued: **Filed herewith**
Title: **BUILDING COMPONENTS AND METHOD OF MAKING SAME**

Attorney's Docket No.: **247P1US**

VERIFIED STATEMENT (DECLARATION) CLAIMING SMALL ENTITY STATUS
(37 CFR 1.9(f) & 1.27(b))–INDEPENDENT INVENTOR

As a below named inventor, I hereby declare that I qualify as an independent inventor as defined in 37 CFR 1.9(c) for purposes of paying reduced fees to the Patent and Trademark Office regarding the invention entitled **BUILDING COMPONENTS AND METHOD OF MAKING SAME** described in:

- ■ the specification filed herewith
- ☐ application serial number , filed .
- ☐ patent number , issued .

I have not assigned, granted, conveyed or licensed and am under no obligation under contract or law to assign, grant, convey or license, any rights in the invention to any person who would not qualify as an independent inventor under 37 CFR 1.9(c) if that person had made the invention, or to any concern which would not qualify as a small business concern under 37 CFR 1.9(d) or a nonprofit organization under 37 CFR 1.9(e).

Each person, concern or organization to which I have assigned, granted conveyed, or licensed or am under an obligation under contract or law to assign, grant, convey, or license any rights in the invention is listed below:*

- ☐ No such person, concern or organization
- ☐ Persons, concerns or organizations listed below*

* Note: Separate verified statements are required from each named person, concern or organization having rights to the invention averring to their status as small entities. (37 CFR 1.27)

NAME
ADDRESS

☐ INDIVIDUAL ☐ SMALL BUSINESS CONCERN ☐ NONPROFIT ORGANIZATION

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 CFR 1.28(b))

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that wilful false statements and the like so made are punishable by a fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such wilful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

Meho Karalic
NAME OF INVENTOR

Signature of inventor

Date October 6, 1999

T11.247

TITLE

BUILDING COMPONENTS AND METHOD OF MAKING SAME

BACKGROUND OF THE INVENTION

Field of the Invention

The present invention relates to building components, for incorporation into building structures, and to methods of making building components.

Description of the Related Art

In the construction of timber frame buildings, it has previously been proposed to prefabricate a rectangular frame, formed of lengths of lumber connected together to form the frame, and to subsequently incorporate this prefabricated frame in the wall of a timber frame building structure so as to reinforce the wall against racking forces produced, for example, by hurricanes or earthquakes.

Such prefabricated rectangular frames can be reinforced against racking forces by lengths of lumber suitably arranged within the frame and interconnecting the sides, top and bottom of the frame, by suitable sheathing and/or by metal corner reinforcements provided at the corners of the frame.

BRIEF SUMMARY OF THE INVENTION

The present invention is based on the concept that a prefabricated building component in the form of a frame can advantageously be reinforced by applying a reinforcement sheet to a part or to the entirety of at least one side of the frame so as to form a hardened reinforcement layer or "skin" on the frame, this layer or "skin" being resistant to outside forces and, thus, to deformation of the frame by racking forces.

The reinforcement sheet may be a coating material applied in a flowable condition to the frame and may be reinforced by fibers to form a fiber reinforced composite. For example, a mesh of reinforcement fibres can be applied to one or both sides of the frame and the layer of the coating material can then be applied, in a flowable condition, onto the mesh so as to penetrate the mesh and to adhere to the lumber of the frame.

Alternatively, the reinforcement sheet may be made separately from the frame and subsequently applied as a prefabricated reinforcement sub-component to the frame.

Preferably, heat insulating foam material is provided in the frame between the lengths of lumber so as to form a heat barrier, and the coating material is applied so as to coat and adhere to one side of this heat insulating barrier.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will be more readily understood from the following description of a preferred embodiment thereof given, by way of example, with reference to the accompanying drawings, in which:-

Figure 1 shows a view in front elevation of a building component according to one embodiment of the present invention;

Fig. 1A shows a broken-away view of an adjacent pair of building components such as that of Fig. 1;

Figure 1B shows a view in perspective of a corner connector employed in the building components of Figures 1 and 1A;

Figure 1C shows a view in perspective of a modification of the corner connector of

Figure 1B;

Figure 2 shows a broken-away view taken in section along the line 2 - 2 of Figure 1;

Figure 3 shows a broken-away view in front elevation of a corner portion of the building component of Figures 1 and 2; and

Figure 4 shows a view in side elevation of a further corner connector.

DESCRIPTION OF THE PREFERRED EMBODIMENT

As shown in Figure 1 of the drawings, a building component, which is indicated generally by reference numeral 10, comprises a rectangular frame assembled from lengths of lumber and, more particularly, the frame is formed by top and bottom rails 12 and 14, by opposite side members 16 and by vertical studs 18 spaced apart from one another, in a conventional manner, between the side members 16 and extending between the top and bottom rails 12 and 14. These lengths of lumber are connected to one another, in a conventional manner, by nails (not shown), and in addition metal corner reinforcements 20 are provided at the four corners of the frame, between the top and bottom rails 12 and 14 and the side members 16.

In the spaces between the top and bottom rails 12 and 14, the side members 16 and the studs 18, a heat insulating foam material 22 is provided so as to form a heat insulating barrier 24. As can be seen in the cross-section of view of Figure 2, this heat insulating barrier 24 occupies only approximately one half of the spaces between the studs 18 and the side members 16, so as to leave the remainders of these spaces free for accommodating plumbing, electrical conduits, etc.

Over one entire side of the frame, there is a provided a reinforcement sheet in the form of a coating layer indicated generally by reference numeral 26. This reinforcement coating layer 26 adheres to the lengths of lumber and to the heat insulating barrier 24 at this one side of the

building component 10 and, in addition, overlaps and adheres to a portion of the periphery of the frame.

Within the reinforcement layer 26 there is provided a reinforcement of fibre material and, more particularly, a mesh 28 of fibre material, which likewise extends over the entire area of one side of the frame and, also, overlaps the peripheral of the frame.

One material which has been found to be suitable as the material of the reinforcement coating layer is sold under the trade mark GINSITE by Ginsite Materials, Inc., of Plantation, Florida, U.S.A. , but other suitable coating materials may be substituted. It is, however, a requirement of the coating material that it can be applied and adhered to the frame and that it subsequently resists forces exerted on the coating material and, thus, will resist distortion of the frame by racking forces applied to the frame.

In the present embodiment of the invention, the fiber material of the mesh 28 is glass fiber. However, other suitable fiber materials may be alternatively employed. For example, carbon fiber, aramid fiber, organic fiber material such as sisal, bamboo, wood or straw, or metal fibers, such as steel, aluminum, etc., may be utilized.

For further information as to suitable fiber reinforced composite materials, reference is made to THE SCIENCE AND TECHNOLOGY OF ENGINEERING MATERIALS", pp. 359 - 363, by J. Francis Young, published by Prentice-Hall, Inc.

It may be possible, in some cases, to omit the reinforcement fibres, provided that the coating material itself provides sufficient resistance to racking forces.

One of the corner reinforcements 20 is shown in greater detail in Figure 1B and comprises a box-shaped section 30 having four sides 32, 33, 34 and 35; laterally extending flange 36 and 37 projecting horizontally from the sides 33 and 35 and a vertically extending flange 38 projecting

from the side 32, i.e. the top, of the box-shaped section 30. More particularly, the flanges 36 and 38 extend from the mid-sections of the sides 33 and 32, which as can be seen from Figure 1A are dimensioned so that the flanges 36 and 37 fit snugly on top of the rails 14 of an adjacent pair of the frames of Figure 1, while the vertical flange 38 fits between the vertical sides of these two frames. The flanges 36, 37 and 38 are secured to the frames by nails or staples (not shown), with the ends of the lumber in abutment with the box-shaped section 30.

The modified corner connector shown in Figure 1C and indicated generally by reference numeral 20a has a box-shaped section 30a with lateral and vertical flanges 37a and 38a, but in this case the flanges 37a and 38a are located in alignment with sides 34a and 35a at the bottom and one side of the box-shaped section 30a. This corner connector 20a is intended for connection to the lumber of only one of the frames, so as to not project from the frame. If required, the corner connecter 20a of Figure 1C can be further modified by the addition of a vertical flange 40 extending along one or both longitudinal sides of the lateral flange 36a and secured to the rail 14 by nails or staples (not shown).

In the making of the building component 10, the lengths of lumber are firstly connected to one another by nailing and by the corner reinforcements in order to form the frame, and the heat insulating foam material 22 is then injected into the frame so as to form the heat insulating barrier 24.

The reinforcement fibre material mesh is then spread over one side of the frame, on the lumber and the heat insulating barrier 24, and the coating material is subsequently applied onto the reinforcement fibre material mesh so that it impregnates the mesh and adheres to the lumber and to the heat insulating barrier 24. The material may be thus applied manually by e.g. a trowelling or scraping action, or by spraying, e.g. by relative movement between the frame and one or more spray nozzles. The coating material is then left to harden so as to form the reinforcement "skin" or sheet on the frame

Alternatively, the barrier 24 may be formed between the lengths of lumber after the reinforcement layer 26 has been formed., the fiber material mesh being applied to the frame prior to the application of the heat insulating foam material.

As shown in Figure 2, the reinforcement layer 26 is applied on both sides, on the peripheral edge and on a portion of the rear side of the G1
frame, although it may be applied so as to cover only a portion of one or both sides of the frame..

Thus, it is to be understood that Figures 1 to 3 illustrate only one embodiment of the invention, and that various modifications may be made within the scope of the present invention.

For example, it may not always be essential for the reinforcement sheet or "skin" to be co-extensive with one side of the frame but, rather, this sheet may be provided in the form of a diagonal strip or diagonal X-shape to the frame. It is not essential for the frame to be rectangular.

Also, while the building component 10 is intended for subsequent incorporation into the wall of a timber frame building, it is to be understood that the present invention is not restricted to wall components but may, for example, be employed for panels for roofs, floors or other structural components.

I CLAIM:

1. A building comprising a plurality of lengths of lumber assembled into a frame, and a reinforcement sheet of solidified fiber reinforced composite material secured to said lumber lengths so as to resist distortion of the frame by racking forces exerted on the frame.

2. A building component as claimed in claim 1, including a foam insulation material within the frame and forming a heat insulating barrier between the lengths of lumber, said reinforcement sheet adhering to said frame and to said barrier.

3. A building component as claimed in claim 1, wherein said reinforcement sheet is co-extensive with said barrier and said lumber at at least one side of said frame.

4. A building component as claimed in claim 1, wherein said reinforcing fibres form a mesh of fibre material embedded in said composite material.

5. A building component as claimed in claim 1, wherein said reinforcement sheet overlaps and adheres to peripheral surfaces of said frame.

6. A method of making a building component, which comprises the steps of connecting together a plurality of lengths of lumber to form a frame, forming at one side of said frame a layer of a coating material and causing the coating material to solidify in adherence with said lumber so as to reinforce said frame against racking.

7. A method as claimed in claim 7, which includes providing foam heat insulation between the lengths of lumber to form a heat insulating barrier.

8. A method as claimed in claim 6, which includes providing fibre material as a

reinforcement in said coating material.

9. A method as claimed in claim 6, which includes placing a mesh of said fibre material at at least one side of said frame and subsequently coating said mesh with said coating material so as cause said coating material to impregnate said mesh and to adhere to said heat insulating barrier and said lumber.

10. A method as claimed in claim 7, which includes applying said coating material layer so as to entirely cover at least one side of said frame.

11. A method as claimed in claim 7, in which said coating material is applied to said frame so as to overlap and adhere to said lumber at peripheral edges of said frame.

12. A method as claimed in claim 1, which includes connecting metal corner reinforcements to said lumber at corners of said frame to reinforce said frame.

13. A method of making a building component, which comprises the steps of connecting together a plurality of lengths of lumber to form a frame and securing to at least one side of the frame a prefabricated reenforcement sheet comprising a fiber reinforced composite material.

14. A method as claimed in claim 13, which includes forming a heat insulating barrier of heat insulating material in the frame after the securing of the reinforcement sheet to the frame.

ABSTRACT OF THE DISCLOSURE

A prefabricated building component, e.g. for incorporation in a wall, a floor, a roof or another building component, comprises a frame formed by lengths of lumber with heat insulating foam material provided in spaces between the lumber so as to form a heating insulating barrier. To reinforce the frame against racking forces, a reinforcement sheet of fiber reinforced composite material is provided on the barrier and the lumber at least one side of the frame.

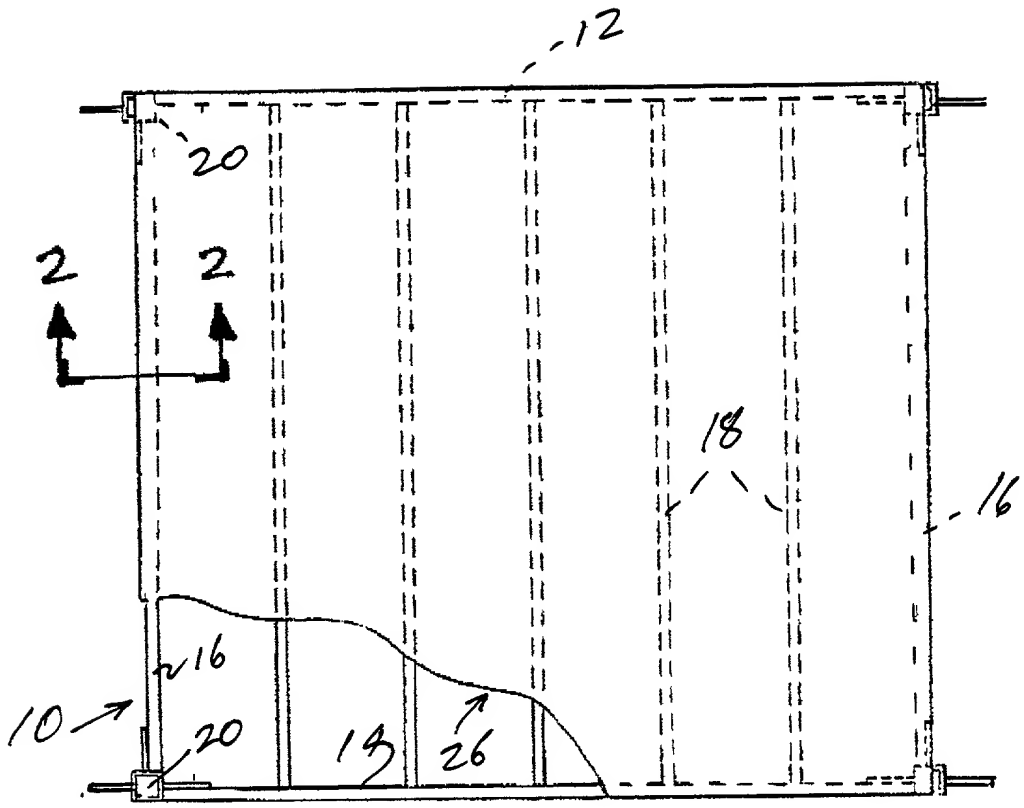

FIG. 1

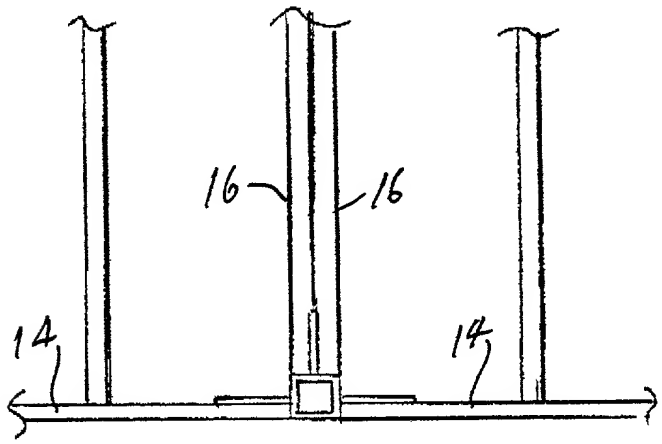

FIG. 1A

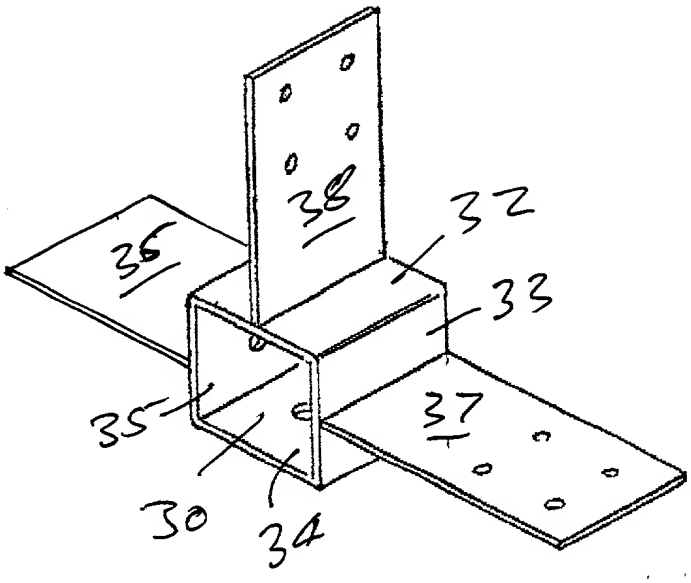

FIG. 1B

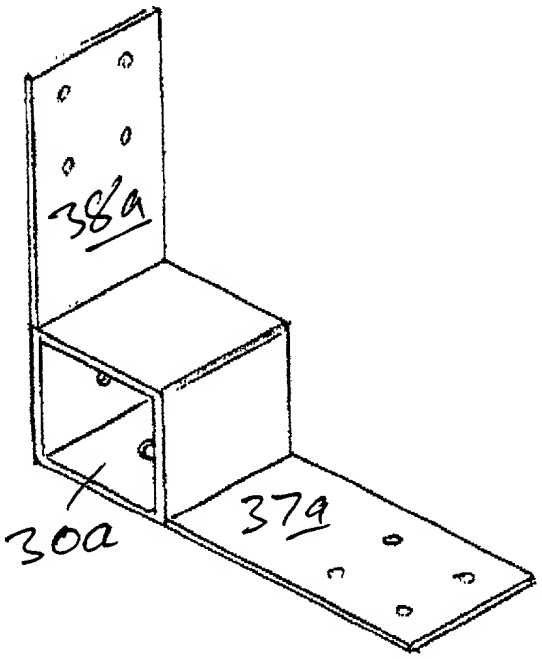

FIG. 1C

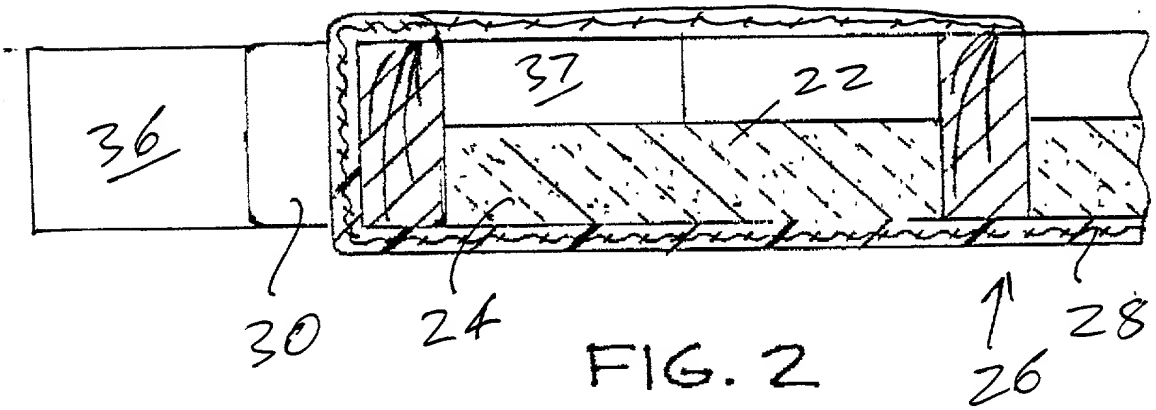

FIG. 2

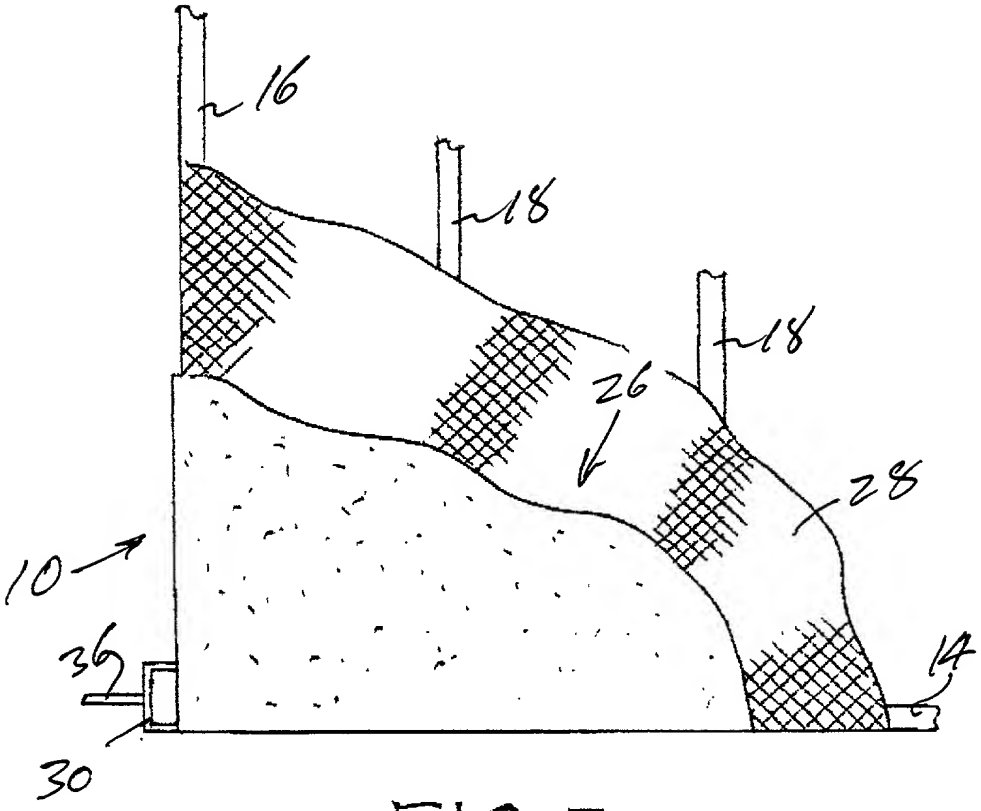

FIG. 3

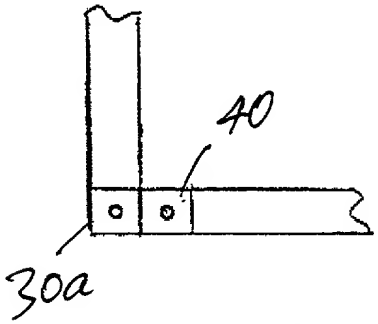

FIG. 4

Attorney's Docket No. 247P1US

DECLARATION AND POWER OF ATTORNEY - ORIGINAL APPLICATION

As below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below beneath my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled **BUILDING COMPONENTS AND METHOD OF MAKING SAME**, the specification of which

(check one)
- X is attached hereto.
- ___ was filed on _____ as Application Serial No. _____ and was amended on _____.
- ___ was filed as PCT international Application Number _____ on _____ and was amended under PCT Article 19 on _____ (if applicable).

I hereby state that I have reviewed and understood the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate or of any PCT international application(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application(s) for patent or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application on which priority is claimed.

PRIOR FOREIGN/PCT APPLICATION(S) AND ANY PRIORITY CLAIMS UNDER 35 U.S.C. 119

PRIOR FOREIGN APPLICATION(S)			Priority Claimed
2,249,823 (Number)	Canada (Country)	8/10/1998 (Day/Month/Year Filed)	■ Yes ☐ No
_____ (Number)	_____ (Country)	_____ (Day/Month/Year Filed)	☐ Yes ☐ No
_____ (Number)	_____ (Country)	_____ (Day/Month/Year Filed)	☐ Yes ☐ No

I hereby claim the benefit under 35 U.S.C. §119(e) of any United States provisional application(s) listed below.

None (Application Number)	_____ (Filing Date)
_____ (Application Number)	_____ (Filing Date)

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) or PCT international application(s) designating the United States of America that is/are listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States applications in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

PRIOR U.S. APPLICATIONS OR PCT INTERNATIONAL APPLICATIONS DESIGNATING THE US. FOR BENEFIT UNDER 35 U.S.C. 120:

U.S. APPLICATIONS

None		
(Application Serial No.)	(Filing date)	(Status)(patented, pending, abandoned)
(Application Serial No.)	(Filing date)	(Status)(patented, pending, abandoned)

PCT APPLICATIONS DESIGNATING THE U.S.

PCT Application No.	PCT Filing Date	U.S. Serial Numbers Assigned (if any)
None		
(Application Serial No.)	(Filing date)	(Status)(patented, pending, abandoned)
(Application Serial No.)	(Filing date)	(Status)(patented, pending, abandoned)

As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith:

CUSTOMER NUMBER 20577

SEND CORRESPONDENCE TO: **CUSTOMER NUMBER 20577**

DIRECT TELEPHONE CALLS TO: **Brian M. Long (604) 687-5513**

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that wilful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code and that such wilful false statements may jeopardize the validity of the application or any patent issued thereon.

Full name of sole or first inventor: **Mebo Karalic**

Inventor's signature

October 6. 1999
Date

Residence: North Vancouver, British Columbia Canada V7K 1C3
Citizenship: Canadian
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T10.247